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Effects of an Educational Program on Dysphagia Screening for Acute Stroke Patients in the Emergency Department

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EFFECTS OF AN EDUCATIONAL PROGRAM ON DYSPHAGIA SCREENING FOR ACUTE STROKE PATIENTS IN THE EMERGENCY DEPARTMENT

Systems Change Project

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This is to certify that I have examined this

Doctor of Nursing Practice systems change project

written by

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and have found that it is complete and satisfactory in all respects,

and that any and all revisions required by

the final examining committee have been made.

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EXECUTIVE SUMMARY

EFFECTS OF AN EDUCATIONAL PROGRAM ON DYSPHAGIA SCRENING IN THE EMERGENCY DEPARTMENT

This was a non-randomized outcome research study to determine whether an educational program provided to emergency department (ED) nurses would alter compliance of dysphagia screening for acute stroke patients. Patients included in the study were greater than 18 years of age with stroke symptoms of unilateral weakness or numbness, changes in speech or vision, facial droop, balance difficulties or sudden and severe headache. Data was obtained by chart review after the patients were discharged from the hospital. 146 patient charts from July to December of 2008 were reviewed for dysphagia screening compliance (pre-education) and compared to 138 charts from July-December 2009 (post education). A two sample t-Test comparing data pre-intervention with post-intervention did not show statistical significance in dysphagia screening compliance with a level of 0.66 using a P value of 0.05.

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CHAPTER 1: BACKGROUND AND SIGNIFICANCE OF THE PROJECT

Stroke is the third leading cause of death and the leading cause of serious, long term disability in the United States. In 2004, there were more than 150,000 stroke related deaths, accounting for 1 of every 16 deaths in the United States (American Heart Association [AHA], 2007). Approximately 700,000 people in the United States have a new or recurrent stroke each year, with an estimated cost of $62.7 billion, but the most significant cost remains the human cost (AHA, 2007). Up to 50% of strokes result in death, and those patients that do survive are often times disabled. Although stroke is devastating, and its impact is widespread, many people do not have knowledge about stroke and the latest treatments that are available. Prior to 1995, there was no treatment available to lessen the effects of stroke after the patient was initially stabilized, and a wait and watch approach was taken. Since then there have been huge advances in stroke treatment and this approach has been abandoned. North Memorial Medical Center (NMMC) has a comprehensive stroke program that provides care for stroke patients across the entire continuum from initial onset of stroke symptoms through rehabilitation and has developed an efficient care model for stroke patients arriving in the emergency department (ED). The acute care process starts with trained emergency medical technicians in the field that rapidly recognize stroke symptoms and alert the hospital of the patient's arrival. Once in the emergency department the team continues to rapidly assess symptoms, obtain critical laboratory values, get chest X-ray, EKG, and brain imaging. NMMC uses the latest treatments in acute stroke care including intra-venous and intra-arterial tissue plasminogen activator (t-PA), cerebral angiography, and mechanical clot removal with the Merci and Penumbra device. NMMC

strives to achieve a “door to needle” time for giving thrombolytic medication of forty five minutes. By offering access to new, established, and experimental treatments for stroke, patients have the best chance for neurologic recovery. Delay in presenting to the emergency department continues to be the primary cause for patient exclusion from interventional opportunities. Creating awareness and providing education about stroke is the first step in preventing stroke. It is North Memorial’s commitment to continuously be present in the community to identify those at risk for stroke, educate about signs and symptoms of stroke, and encourage people to act quickly by calling 9-1-1, as thrombolytic efficacy is reduced with time. People need to be aware that strokes also known as “brain attacks” should be treated without delay, very much like heart attacks.

NMMC has a stroke registrar and coordinator that perform thorough chart reviews on all stroke patients after they leave the hospital. Data is compiled on multiple performance measures required by Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) and distributed to members of the stroke team. Joint Commission evaluates ten performance measures when inspecting stroke centers for certification. These performance measures include 1) the use of cholesterol lowering medications at discharge; 2) the use of thrombolytic therapy when appropriate; 3) the initiation of antithrombotic therapy by hospital day two; 4) the use of anticoagulation in patients with atrial fibrillation; 5) the use of deep vein thrombosis prophylaxis; 6) appropriate assessment for rehabilitation; 7) provision of stroke education; 8) provision of smoking cessation information; 9) assurance that patients are discharged on antithrombotics; 10) dysphagia screening assessment in the emergency department. Data collected on dysphagia screening at NMMC indicates that nurses in the

emergency department are only sporadically compliant with this performance measure. NMMC's stroke team consists of physicians, emergency and nursing specialists, neurologists, neurosurgeons, interventional radiologists, speech pathologists, physical and occupational therapists, CT and MRI technicians, X-ray and lab technicians, and clergy. Successful stroke care depends on close multidisciplinary collaboration. The ED nurse is perhaps the one person who is consistently present with the patient in the acute stages. The nurse is a key player in detecting status changes in the patient, and in screening for dysphagia.

Dysphagia or the inability to swallow is a common complication following ischemic or hemorrhagic stroke and is strongly associated with poor outcomes. Dysphagia occurs in the first 1-3 days in 42-67% of patients with acute stroke (Katzan, Cebul, Husak, Dawson & Baker, 2003). Evidence based research has demonstrated the importance of dysphagia screening in acute stroke patients.

This project faced several challenges including staffing changes that came about as a direct result of today's economic downturn. There were fifteen nurses in the ED that were layed-off immediately prior to the start of this project. However, once the educational program and data collection began, there were no further staffing changes greater than normal attrition. Another challenge was to connect with all the nurses that work in the stabilization room where stroke patients initially receive care. ED nurses work a mix of eight and twelve hour shifts requiring multiple educational sessions to accommodate all the nurses involved. The third challenge in this attempt to improve dysphagia screening is limited time, but unfortunately there is no viable solution. Nurses in the ED have multiple tasks to complete in a short amount of time when patients first

arrive in the stabilization room. Nurses are competing for access to the patient with other stroke team members getting physical assessments, imaging and initiation of possible interventions that also need to get done quickly.

Stroke centers achieve certification when JCAHO guidelines are met and include thorough site investigations. Data regarding the 10 performance measures listed above are criteria for attaining as well as retaining ongoing certification. The strength of a stroke program is rewarded by its certification status. NMMC first achieved certification in 1998, and was the first certified stroke center in Minnesota. NMMC has been nationally rated in the top 10% of stroke centers for the past 5 years. Re-certification has been achieved with members of the stroke team working hard to continue to be innovative and provide the latest treatments in stroke care. This project is congruent with NMMC's goal to improve compliance of dysphagia screening for acute stroke patients and meet JCAHO guidelines.

PRINCIPLES OF SOCIAL JUSTICE

Social justice is the concept that describes the movement towards a socially just world of human rights and equality. Social justice is defined as "the way in which human rights are manifested in the everyday lives of people at every level of society" (Bankston, 2010). There are ten principles related to social justice with the following five being highlighted in this project 1) intrinsic rights and responsibilities 2) the call to family the call to family 3) community and participation 4) solidarity and 5) human equality.

A Conceptual Framework of Social Justice in Nursing discusses that a goal of nursing is to defend the dignity of those in our care (American Nurses Association,

2003). “The nurse promotes, advocates for, and strives to protect health, safety, and rights of the patient. The nurse is responsible and accountable for individual nursing practice and owes the same duties to self as to others, including the responsibility to preserve integrity and safety, to maintain competence, and to continue personal and professional growth” (American Nurses Association, 2003). This describes the principle of intrinsic rights and responsibilities and reflects the need to improve the performance of nurses to protect the safety of patients. Performance outcomes have indicated that nurses in the ED at NMMC comply with dysphagia screening for acute stroke patients only 70% of the time. Dysphagia screening is a critical standard of care set by JCAHO and can significantly diminish complications after stroke. Given the fact that there are 700,000 strokes annually, a formal dysphagia screening protocol could save more than 8,000 lives and prevent 40,000 cases of pneumonia each year (Warnecke et al, 2008). The ED nurses at NMMC must be responsible and accountable for their nursing practice, and need to strive to protect the health and safety of the patients in their care.

The second principle of social justice upheld when a stroke patient is admitted for care at NMMC is the call to family. Families and loved ones are rapidly and repeatedly kept informed about the status of their family members care. An important member of the stroke team is clergy. They are readily available to give families emotional and spiritual comfort until medical information is able to be shared with them. As soon as the patient is stable they are invited to come into the stabilization room to be with their loved one and get updated information. NMMC supports family centered care and families are encouraged to stay with loved ones while they are hospitalized, knowing that family support is a large part of the recovery process.

Another principle of social justice evident in our stroke program is the commitment to educating the community. Outreach programs have been held in church basements, barber shops, assisted living facilities and community activity centers to inform the public about stroke warning signs, risk factors (both modifiable and non-modifiable), and the need to respond quickly should symptoms occur. Before 1995, there were no treatments available for stroke after the patient was stabilized. Since that time, new interventional treatments have been initiated that can lessen the effects of stroke. Interventional opportunities however have a limited time to be initiated after the onset of symptoms, and it is imperative that patients activate the emergency medical system (EMS) right away. Patients that delay arrival to the emergency department for various reasons, limit our ability to use interventional techniques. These points are stressed in our community education sessions.

Solidarity is an important principle of social justice that NMMC works hard to uphold. It is important that patients participate in their own care whenever possible. Health care workers have the responsibility to share their knowledge and skill to enhance autonomy and provide opportunities for patients to take responsibility for their own lives and their own health. It is important to use every patient encounter to maximize educational opportunities. Patients have the right to be kept informed of their medical condition. When patients are armed with knowledge and understanding, they have a better ability to accept or refuse the treatment modalities available to them.

The principle of human equality discusses the need for universal health care. North Memorial Medical Center strives to meet the needs of patients without discrimination on the basis of religion, social standing, gender, political affiliation, age,

handicap or mental disorder. Strokes are more common in patients over 65 years of age and in the minority groups of American Indian, African American, and Asian American populations. There are equal opportunities for access to stroke care for minority populations if the emergency medical system is accessed. Uniform care is provided to all stroke patients through the use of stroke protocols and order sets. The protocol established for care of acute stroke patients should not vary from person to person.

The conceptual framework of social justice in nursing is manifested in this entire project. Everyone has basic rights, including the right to life. It is the nurses responsibility to promote, advocate for and protect the health and safety of patients in their care. The stroke team at NMMC continually strives to improve care for stroke patients by working together toward a common goal. This project is an example of NMMCs effort to provide the best care possible for stroke patients.

PROJECT OBJECTIVES

1. Generate consistent nursing practice through education of evidence based data.
2. Lead and influence change in nursing practice to improve clinical outcomes.
3. Meet required JCAHO performance measures for stroke patients.
4. Achieve at least 90% compliance of dysphagia screening of acute stroke patients.

CHAPTER 2: THEORETICAL FRAMEWORK

Today's healthcare comes with significant challenges ranging from financial constraints of hospitals, staff reductions, change in reimbursement, and large numbers of patients lacking health care coverage changing the way they access the healthcare system. Due to these challenges it is important when working within a large healthcare system that the focus on the patient is not lost. Practicing within a nursing theory creates an environment that is patient centered.

The role of the nurse in recognizing early changes in patient status is an important part of nursing practice and reflects the caring relationship between patient and nurse. In a caring relationship, the well being of the patient clearly matters to the nurse. It is the nurse's responsibility to provide for the patient what he/she cannot do for themselves.

Jean Watson's *Theory of Human Caring* is the theory that shaped this project. It takes a holistic approach to nursing that encompasses body, mind, and spirit, and stresses the human connection between nurse and patient. This unique relationship centers on the "human being" in the hospital bed with thoughts, beliefs, fears, hopes, dreams, loved ones, and a story that has brought them to this place in their life. The caring union between patient and nurse is the essence of nursing (Watson, 2002). Today's healthcare delivery system emphasizes curing over caring and therefore can strain this theory in practice. It is important in practice to keep a balance of both. Providing patients healthcare that is evidence based is the greatest form of caring, as it means our patients have the best chance for a positive outcome.

Jean Watson's theory was extended by Lewis Mustard (2002) to include competency. These connected issues address concerns of patient safety and substandard patient care. Mustard's theory introduces an educational agenda with nursing staff to assist in creating a new environment to improve care practices by helping to increase oversight, decrease injury, accidents, death and improve overall safety standards. Mustard's model proposes an Advanced Practice Nurse (APN) Hospitalist role who is an expert in both caring and competency with the goal of improving the performance of acute care nurses. My position at NMMC is that of an APN Hospitalist with the Neurology service and provides a unique opportunity to interface daily with nurses caring for stroke patients with the goal of improving care practices and patient outcomes.

LITERATURE REVIEW AND SYNTHESIS

The literature was searched for research studies about dysphagia in acute stroke and the role of the nurse in performing initial swallow assessments. Computerized searches of MedLine, CINAHL, Cochrane Databases of Systemic Reviews, PubMed as well as Up-to-Date were performed. In addition, relevant references cited in reviewed articles were retrieved. Keywords used in the search were stroke, acute stroke management, dysphagia, aspiration pneumonia and emergency room care for stroke. Thirty-five articles were evaluated dating back to 1989, with most of the selected literature being written in the last ten years. A common finding in all the research studies is the high prevalence of dysphagia after stroke. Research has also been extensive on various vascular territories causing dysphagia; the risk of dysphagia with hemorrhagic versus ischemic stroke; various dysphagia therapies; requirements of tube feedings with

dysphagia; pulmonary complications with dysphagia; silent aspiration with stroke; gag reflex and its usefulness in managing dysphagia; a variety of dysphagia screening procedures and the usefulness of a bedside swallow assessment versus video swallow. As stroke is so prevalent, the majority of the research studies took place in large metropolitan medical centers with a significant number of patients enrolled. The new concept in stroke management involves telemedicine for rural areas. Via tele-monitor, decisions regarding patient care and stroke treatments are now decided. There are new opportunities for research on the efficacy of treating patients in rural hospitals versus transporting them to stroke centers that have established acute care protocols. Research studies reviewed for this project available in appendix A.

Dysphagia is a term used to describe swallowing disorders that may occur in the oral and/or pharyngeal phase of swallowing. There are four phases of the normal swallow. The first starts at the sight, smell, and taste of food by triggering the production of saliva making chewing easier. The second phase begins when food is chewed forming a soft bolus. The tongue moves food to the back of the mouth and to the top of the esophagus also called the pharynx. The third phase of swallow starts when the food reaches the pharynx. The larynx closes to prevent food or liquids from getting into the upper airway and lungs. In this stage the food bolus passes down the esophagus. In the fourth stage of swallow the esophagus contracts automatically to propel food down to the stomach. For some patients, poorly coordinated swallowing allows food to enter the airway below the level of the vocal cords making oral feeding a significant risk (Ramsey, Smithard, Kalra, 2003). Dysphagia is a common complication in stroke patients and is associated with malnutrition, dehydration, aspiration, suffocation, pneumonia, prolonged

hospitalizations, increased mortality and poor long-term outcomes (Warnecke et al, 2008). The brain is a complicated organ with specific areas designated for individual functions. There are however multiple areas of the brain when injured by stroke that can lead to dysphagia. Aspiration pneumonia is thought to occur most often as a result of oropharyngeal dysphagia with secondary aspiration. Aspiration in the first 1-5 days occurs in 19.5-42% of hospitalized stroke patients (Trapl, Enderle, Nowotny & Teuschl, 2009). The rate of aspiration in acute stroke patients at North Memorial Medical Center is 19%. In some patients, aspiration causes no outward signs of distress, called silent aspiration. In these patients there is no cough reflex present. Stroke patients that develop aspiration pneumonia have a threefold increased risk of mortality within 30 days (Katzan, Cebul, Husak, Dawson & Baker, 2007). Many cases of pneumonia are preventable when stroke protocols such as swallow screening and dietary modification are followed. Patients should get oral food, fluids and medications only after they pass a dysphagia screening. Those that do not pass, get fluids, nutrition and medication either via intravenous feedings or tube feedings. Stroke patients are frequently given aspirin in the emergency department as part of the stroke protocol. Aspirin can be given rectally until they are cleared to swallow and thus there should be no delay in appropriate treatment. Aspirin is available in the intravenous form but is currently in phase III trials and not yet approved for use in the United States.

Pneumonia contributes to up to 34% of all stroke deaths and represents the third highest cause of mortality in the first month after stroke. The development of pneumonia after stroke results in additional financial costs and lengthens hospital stays by an average of 7 days (Addington, Stephens & Gilliland, 1999). Pneumonia in stroke

patients is often a result of aspiration, but consistent use of dysphagia screening can significantly decrease the risk of pneumonia and in turn produce better clinical outcomes for patients. Once again the need for a multidisciplinary team approach highlights early assessment by the bedside nurse and formal evaluation by a Speech and Language Pathologist (Trapl, Enderie, Nowotny & Teuschl, 2009).

There are six established clinical predictors that may be used to identify patients at risk of aspiration after stroke. Those include dysphonia, dysarthria, abnormal gag reflex, abnormal volitional cough, cough after swallow and voice change after swallow. Daniels (2000) found that 68% of patients with acute stroke had two or more clinical predictors, while 32% had one or none. Patients that had two or more clinical predictors were ranked as having moderate to severe dysphagia. None of the patients in the study developed aspiration pneumonia, and 93% were able to resume a normal diet prior to discharge from the hospital. Dysphagia in stroke is commonly seen in patients with brain stem lesions, but can frequently be noted in patients with unilateral hemisphere lesions.

Prevention of aspiration is a multidisciplinary task, but nurses have the greatest opportunity to assess that patients are having difficulty swallowing. There are several subtle signs and symptoms to indicate that a patient may be having difficulty swallowing. Initial signs of dysphagia include, refusal to eat, drooling, choking on oral secretions, breathlessness, lack of tongue movements, poor facial muscle tone, and inability to follow commands (Davis,1999). Given the incidence of stroke, the prevalence of dysphagia, the risk of aspiration, and the effects of pneumonia in terms of cost of

care, mortality and morbidity, the identification of patients with dysphagia in the acute phase of stroke treatment is clinically and financially significant.

CHAPTER 3: PROJECT DESIGN AND METHODOLOGY

There are many change theories and assumptions regarding how successful change happens. For the purpose of this DNP project Lippitt's Phases of Change Theory, Social Cognitive Theory, Theory of Reasoned Action and Planned Behavior as well as Lewin's Three-Step Change Theory were reviewed. Lewin's Change Theory seemed to be the most appropriate as it is very straight forward and goal oriented. Lewin was the first to work on a stepwise model of change in 1951 that characterized change as disequilibrium between driving and restraining forces. If these opposing forces are balanced (in a state of equilibrium), no change can occur. Change is disruptive and messy and therefore only occurs in a state of disequilibrium when restraining forces are overcome by opposing forces (Nadler, 1998). Kurt Lewin theorized a three-stage model of change highlighting the steps of unfreezing, change and refreezing (Schein, 1995). Unfreezing is the first step in the process to change behavior. It involves motivating people to prepare for change, building trust, providing education so that everyone understands the need for change, recognizing problems and brainstorming solutions. The early steps of the unfreezing process in this DNP project consisted of stroke team meetings to discuss poor performance of dysphagia screening. Educational sessions with the ED nurses were arranged to ensure the nurses understood the need for change, to provide them with an opportunity to view the problem from another prospective and point out the potential risks to patients if behaviors do not change.

The second step of the change process is implementation. Key activities of this step include, encouraging people to view the change from a new perspective; working

together on a new quest; coaching, encouraging and providing leadership in support of the change. For this project, nurse's efforts to change past behaviors were supported and encouraged. Nursing leadership was always present in the ED for help and guidance during the initial care and assessment of stoke patients in the stabilization room.

The third step in Lewin's Theory is refreezing. This step needs to take place after the change has been implemented to make the change sustainable over time. Tasks in the refreezing process include setting performance indicators, monitoring performance, offering rewards for new behavior and sanctions for old behaviors, followed by a period of stability when the new behaviors settle in. Lewin's theory discusses that if this step is omitted, the change will be short lived and a pattern of previous behaviors will ensue. NMMC continuously gathers performance data on measures critical for stroke, and the results of chart audits are shared monthly with stroke team members in the form of a scorecard (graph 3.1 and 3.2) to provide data about the success of the refreeze.

This was a non-randomized outcome research study with data obtained from chart reviews. Participants include all stroke patients coming into NMMC ED. Data was collected on compliance of swallow assessment in the ED for all acute stroke patients from July–December, 2008 and also July–December, 2009. Patient inclusion was all patients over 18 years of age with stroke symptoms including slurred speech, unilateral weakness or numbness, facial droop, severe headache, vision loss, diplopia and/or balance difficulties. Inclusion was not dependent on evidence of stroke by MRI or CT. Data from July- December, 2008 was collected prior to an educational program with the ED nurses. Data from July-December, 2009 was collected after the education was

provided. In June of 2009, I worked with forty-four ED nurses who care for acute stroke patients. The education was provided to reinforce the importance of dysphagia screening in stroke patients prior to oral fluids or medications being given. The education highlighted the nurses role in dysphagia screening; described the four phases of normal swallow; provided instruction on how to perform a step by step swallow assessment; identified signs of aspiration; provided evidence based data on the risk of aspiration as well as morbidity/mortality data on patients that develop aspiration pneumonia; and stressed the necessity to document swallow status in the patient chart. ED nurses at NMMC work eight or twelve hour shifts. To accommodate as many ED nurses as possible on days they were already scheduled to work, twelve- thirty minute educational sessions were held over 3 days in June of 2009. The classes were scheduled at 7AM, 11AM, 3PM, and 7PM to coincide with all shifts. Education was provided for 42 nurses with all but 2 nurses attended one of the class sessions. The remaining 2 were required to read the power point presentation and demonstrate a swallow assessment prior to signing off on the education. Educational power point slides and swallow assessment protocol provided in appendix B.

The stroke registrar at NMMC compiles monthly data on a bar graph pertaining to particular performance indicators around the care of acute stroke management. If the goal of 100% compliance is met by at least 90%, it is indicated in green. If the performance indicators are met by 80-89% it is indicated in yellow. Goals unmet indicate compliance less than 75% of the time and are marked in red. Consistently, initial dysphagia assessment in the ED is an unmet goal. With the risk of aspiration so high in stroke, it is important to the safety of stroke patients at NMMC that performance

of this major issue improve. The following graphs show North Memorial's 2008 and 2009 stroke performance measures.

Joint Commission Stroke Performance Measures Scorecard 2008

North Memorial Health Care

	Driver	Goal	2008 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Best Practice														
Discharged on Cholesterol Reducing Medication - Ischemic only	The JC	100%	85%	64%	86%	50%	68%	58%	86%	80%	100%	93%	92%	80%
IV Thrombolytic Therapy Administered - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
Antithrombotic Therapy By End of Hospital Day Two - Ischemic only	The JC	100%	96%	93%	100%	100%	97%	97%	97%	100%	96%	100%	92%	100%
Discharged on Antithrombotics - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	95%	100%	100%	100%
Patients with Atrial Fibrillation Receiving Anticoagulation Therapy - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Assessed for Rehabilitation - Ischemic/ICH/SAH	The JC	100%	97%	100%	91%	96%	92%	98%	88%	100%	93%	97%	89%	100%
Deep Vein Thrombosis Prophylaxis - Ischemic/ICH/SAH	The JC	100%	75%	90%	87%	83%	94%	96%	79%	70%	87%	94%	95%	88%
Dysphagia Screening - Ischemic/ICH/SAH	The JC	100%	66%	72%	58%	50%	60%	80%	65%	59%	76%	71%	82%	80%
Smoking Cessation/Advice/Counseling - Ischemic/ICH/SAH	The JC	100%	100%	100%	100%	88%	100%	100%	100%	100%	100%	100%	100%	91%
Stroke Education - Ischemic/ICH/SAH	The JC	100%	97%	89%	85%	63%	69%	64%	72%	54%	47%	63%	38%	50%

Joint Commission Stroke Performance Measures Scorecard 2009

North Memorial Health Care

	Driver	Goal	2009 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Best Practice														
Discharged on Cholesterol Reducing Medication - Ischemic only	The JC	100%	88%	91%	97%	92%	96%	88%	92%	100%	95%	90%	96%	85%
IV Thrombolytic Therapy Administered - Ischemic only	The JC	100%	100%	100%	100%	100%	50%	100%	100%	50%	None	100%	100%	100%
Antithrombotic Therapy By End of Hospital Day Two - Ischemic only	The JC	100%	97%	100%	100%	100%	100%	100%	96%	95%	92%	93%	100%	100%
Discharged on Antithrombotics - Ischemic only	The JC	100%	100%	95%	100%	100%	100%	100%	100%	100%	95%	96%	100%	100%
Patients with Atrial Fibrillation Receiving Anticoagulation Therapy - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	50%	100%
Assessed for Rehabilitation - Ischemic/ICH/SAH	The JC	100%	97%	96%	100%	100%	97%	96%	96%	96%	92%	97%	87%	96%
Deep Vein Thrombosis Prophylaxis - Ischemic/ICH/SAH	The JC	100%	87%	94%	92%	90%	100%	85%	81%	90%	72%	87%	100%	88%
Dysphagia Screening - Ischemic/ICH/SAH	The JC	100%	63%	64%	68%	87%	84%	63%	67%	77%	58%	76%	71%	60%
Smoking Cessation/Advice/Counseling - Ischemic/ICH/SAH	The JC	100%	100%	100%	100%	100%	80%	87%	100%	83%	71%	100%	87%	83%
Stroke Education - Ischemic/ICH/SAH	The JC	100%	63%	83%	69%	77%	77%	61%	64%	76%	71%	79%	38%	61%

TIMELINE

Data was gathered on dysphagia screening compliance from July-December, 2008 (pre-education) and was compared to data from July-December, 2009 (post-education). The timeline for this project ran from June 2009, with final data collection complete December 31st of 2009.

Table 3.1. Timetable For Data Collection

7/1/08-12/31/08 Data collected by stroke center on compliance of dysphagia screening of stroke patients.
3/1/09-6/1/09 Meeting with stroke team members and ED nurse manager regarding education schedule for ED nurses. Preparation of educational material.
6/17/09-6/28/09 12-30 minute educational sessions with 42/44 ED nurses.
7/1/09-12/31/09 Data collection by stroke center on compliance of dysphagia screening after the education sessions.

RESOURCES

North Memorial has a strong stroke program with dedicated neurologists, radiologists, ED physicians and nurses, Advanced Practice Nurses, therapists, chaplains, and stroke registrar. The care of stroke patients is collaborative with everyone having their contribution to the care. It is an interactive group that works together to provide the best stroke care for patients entrusting their lives to NMMC staff.

RETURN ON INVESTMENT

The three prime stakeholders for this project include the patient, the organization (North Memorial Medical Center) and the ED staff nurse. Project Development and Educational costs will be compared to potential benefits to the patient, organization and nurse, if dysphagia screening is performed.

PROJECT COSTS

Table 3.2. Implementation Costs

• 12-30 minute classes for 44 nurses (RNs)	• Average wage $42.00 per hour=$924.00
• 6 hours NP pay (class instruction)	• $50.00 per hour=$300.00
• 44-5 page education packets	• Printing and Paper charges 220 sheets= $7.00 paper+ $50.00 laser color cartridge=$57.00

Total=$1281.00

Table 3.3. Development Costs

• 200 hours of planning and research for dysphagia screening improvement project.	• 200 hours @ $50.00 per hour= $10,000.00

Total=$10,000.00

PROJECT RETURNS

Table 3.4. Organizational Impacts

• JC Certified Stroke Center	• JC Certification is a desired goal for any hospital with a stroke program. It is essential to meet performance measure requirements to avoid sanctions. Performance measures include **dysphagia screening**, use of antithrombotic medication, use of statin medication, smoking cessation education provided, DVT prophylaxis, rehabilitation assessment, and anticoagulation used for atrial-fibrilation . The fee for a JC site investigation and certification is $15,000.00. There are no monetary sanctions incurred if areas of investigation are deficient, but the initial investment can be forfeited if a plan for improvement is not put in place.

Table 3.5. Patient Impacts

• Decreased length of hospital stay	• Average length of stay for an acute ischemic stroke is 5 days. On average an additional 7 day hospital stay is required after aspiration. The average per day hospital charge was $4,450 in 2008. Hospital administrators say the numbers do not accurately reflect what it actually costs them to provide the services and care for the patients because there are other burdens associated with being under-reimbursed by government payers such as Medicare and Medicaid (Cheim, 2008).
• Decreased mortality	• Death due to aspiration in acute stroke patients is 19.8 % (Centers for Disease Control, 2008).

• Decreased long term care needs	• Aspiration following stroke due to dysphagia increases the need for discharge to long term care facility versus discharge to home. The average daily cost of Nursing Home in the U.S. for a: Private Room is $209/d; Semi-private $187/d (US Department of Health and Human Services, 2008).
• Decreased need for surgically implanted feeding tube	• Dysphagia and aspiration increase the need for feeding tube placement due to the risk of malnutrition and dehydration. The Laparoscopic Assisted Percutaneous Gastrostomy Tube (LAPGT) Placement is the safest alternative to other methods of gastrostomy tube placement. The initial hospital charges for (LAPGT) estimated at approximately $1050.00. Further analysis is needed to compare overall expenses including need for re-operation and treatment of complications (Siddique et al., 2000)
• Decreased risk of aspiration pneumonia	• There is a 19.5-42% risk of aspiration in the first 1-5 days following stroke in patients with dysphagia. (Trapl,2009)
• Decrease in lost income.	• Per North Memorial Medical Center data, approximately 1/3 of stroke patients are <65 yr old. Approx 20-30 stroke patients per month=7-10 patients per month under 65. Average annual wage $22,880/yr (Ralser,2007)

Table 3.6. Intangible Impacts

• Increased job satisfaction	• RN attrition rate at North Memorial in the past has been approx 20%. However in the current economy with nurses being laid off, the attrition rate is much lower. Job satisfaction could be a factor in lowering this rate.
• Increased competence	• RN self confidence in activities related to their performance. With confidence in RN skills, the desired goal would be to increase compliance in job requirements.
• Improve NM reputation as a certified stroke center	• Potential for increased business with increased credibility as a stroke center. EMTs transporting suspected stroke patients would route patients to North Memorial rather than another facility that is not stroke certified.

ESTIMATE OF POTENTIAL SAVINGS WITH IMPROVEMENT OF DYSPHAGIA SCREENING

A calculation for realistic estimate in the reduction of negative occurrences is based on a 20% improvement in dysphagia compliance. To reach this figure, I used an average of the 2008 dysphagia compliance rate (59-82%) or 70% and compared cost reduction with a desired goal of 90%. Data is based on 240-360 acute stroke patients treated annually at North Memorial.

Table 3.7. Potential Savings

• Decrease Length of Hospital Stay	• **Potential Annual Hospital Costs**= 46Pts x $4,450.00 x 7 days=$1,432,900.00 68Pts x $4,450.00 x 7 days=$2,118,200.00	• **Annual Hospital Costs with 20% improvement=** $1,146,320.00-$1,694,560.00

		• **Potential Savings in Annual Hospital Costs=** $286,580.00-$423,640.00
• Decreased Mortality	• **Potential Deaths due to aspiration in acute stroke patients=**19.8% of 46-68Pts=11.5-17patients	• **Potential reduction in deaths due to aspiration=** 2.3-3.4 patients
• Decrease Long Term Care Costs	• **Potential Annual Long Term Care Costs**= 48 pts x $200/d x 365d=$3,358.000.00 68 pts x $200/d x 365d=$4,964,000.00	• **20% improvement of Long Term Care Costs=** $2,686,400.00-$3,971,200.00 • **Potential Long Term Care Savings=** $671,600.00-$992,800.00
• Decreased Need for Feeding Tube	• **Potential Annual Costs of Feeding Tube**= 46pts x $1,050.00=$48,300.00 68pts x $1,050.00=$71,400,00	• **20% improvement in Cost of Feeding Tube=** $47,640.00-$57,120.00 • **Potential savings in feeding tube costs=** $9,660.00-$14,280.00
• Decreased Risk of Aspiration	• **NM data indicates a 19% aspiration rate in acute stroke patients**. • **Annual rate of aspiration in acute stroke patients=** Total 240-360 stroke patients annually @ 19% aspiration rate=46-68 patients	• **20% reduction in aspiration=**36.8-54.4 patients • **Potential reduction in patients that aspirate=** 9.2-13.6 patients
• Decrease in lost income for patients under 65yrs.	• **Potential annual lost income**= 84pts x $22,880=$1,921,920.00 120ptsx $22,880=$2,745,600.00	• **20% reduction in lost income=** 1,537,536.00-2,196,480

		• **Potential reduction in lost wages=** $384,384.00-$549,120.00

Total Potential Annual Savings for Patients and the Healthcare System with Improved Dysphagia Screening = $1,352,224.00-$1,979,840.00

The difference in total costs of this project with potential savings is $1,341,043.00-$1,968,659.00.

SUPPORT FROM SITE

Given the incidence of stroke and the risk of complications associated with dysphagia, identification of swallowing problems in acute stroke patients is clinically and financially significant. As a certified stroke center, North Memorial Medical Center strives to provide the best stroke care possible. Improvement in compliance of dysphagia screening has been an ongoing goal and is supported by the entire stroke team and organization as a whole. Financially this project required minimal monetary output with the potential for financial gains extensive and more importantly improved patient outcomes.

ETHICAL CONSIDERATIONS

Ethical principles pertinent to this systems change project include beneficence, non-maleficence, patient advocacy, evidence based practice and confidentially. Beneficence, sometimes thought of as the first principle of morality means do good and avoid evil, it applies to actions that benefit others. Beneficence includes protecting and defending the rights of others, rescuing people who are in danger, and helping

individuals with disabilities (Pierce & Smith, 2008). NMMC's stroke program upholds beneficence when established protocols and order sets are followed. Protocols and procedures were developed through the benefit of evidence based research for the purpose of minimizing deficits that can occur following stroke. Other beneficent actions associated with NMMC's stroke program include encouraging smoking cessation, encouraging gentle exercise for patients that are overweight and hyperlipidemic, and encouraging compliance with medication regimes for hypertension and diabetes.

Non-maleficence means do no harm. Healthcare providers must weigh the benefits of treatment against the possible risk of causing more harm (Silva, Ludwick, 1999). It's been well established that dysphagia is a common occurrence after stroke, and that risk of aspiration is high if a patient's swallow is not assessed prior receiving oral food, fluids or medications. Non-maleficence is also exemplified by adhering to thrombolytic time guidelines and not giving tPA to patients that arrive in the ED too late. Evidence based data has shown increased risk of hemorrhage when tissue plasminogen activator is given outside a "window of opportunity", that being three hours for IV medication and six hours for intra-arterial administration (Gonzales-Fernandez, Kleinman, Paul, Ky, Palmer & Hillis, 2008).

Patient advocacy is a fundamental concept in nursing. The American Nurses Association (ANA, 2008) defines advocacy as, "the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of the human response, and advocacy in the case of individuals, families, communities and populations (ANA, 2008)". This definition aptly describes that a nurse's responsibility to a patient includes, promoting

health and preventing injury. Evidence has shown that dysphagia screening is effective in determining a patient's ability to swallow. The simple task of performing a swallow evaluation to determine if dysphagia is present is imperative prior to giving patients oral food, fluids or medications. It is the nurse's responsibility in the ED to assess patients swallow to prevent further injury.

Evidence based medicine is grounded on the theory that the best evaluated methods of health care enables the patient and healthcare team to make better informed decisions (Raatikainen, 2006). Patients entrusting their lives to healthcare teams deserve to get the best care that can be provided. When best practice guidelines are put into effect, patients have the best chance for positive outcomes. Providing patients with healthcare that is evidence based is the greatest form of caring, This change project is based on evidence that performing bedside swallow assessments on patients that have suffered strokes will detect dysphagia, and decrease the risk of aspiration, pneumonia and death.

Patients included in this study were all stroke patients coming into the ED at NMMC during the period of data collection. Data collection was in the form of a retrospective chart review. Charts were scanned for pertinent information by NMMC's stroke registrar. Confidentiality was maintained as no patient names or identifying information was used. No patients were excluded, and standard of care practice guidelines were used for all patients. No informed consent was required beyond the standard consent to treat. Stroke care is considered an emergency medical situation and implied consent for treatment is in effect if there are no family members present and the patient cannot speak for themselves. An informed consent would be obtained for

any interventional procedures if deemed appropriate. Approval from the Institutional Review Board (IRB) at St. Catherine University was obtained. No IRB approval was required from North Memorial Medical Center.

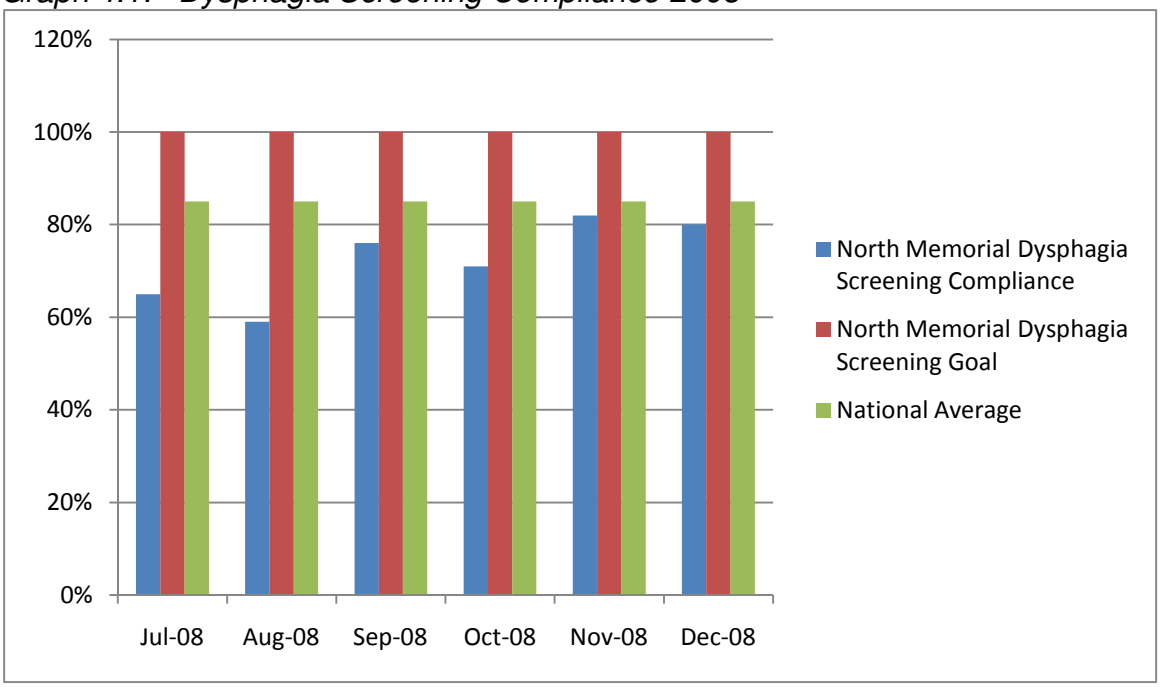
CHAPTER 4: DATA ANALYSIS AND PROJECT EVALUATION

Retrospective data was abstracted from charts of stroke patients to evaluate the level of compliance for dysphagia screening. Retrospective data abstraction is a continuous process at NMMC for the purpose of evaluating care delivery, and was not done strictly for the purpose of this project. Data is routinely collected on all stroke performance measures, but for the purpose of this project, only dysphagia screening compliance data was evaluated. NMMC was using EPIC, an electronic medical record system when data was collected in 2008 as well as 2009. Information recorded by ED RNs and data extracted by the stroke registrar was of the same format throughout this project and therefore is not a confounding factor in study results. This study evaluated the difference in nurse's compliance of dysphagia screening in the ED before and after attending an educational session. Six months of dysphagia screening compliance data prior to the educational sessions was compared to the same 6 month period after education was provided to the ED nurses. Data was collected on swallow assessments performed, with compliance results recorded as a monthly percentage on all stroke patients coming into the ED. NMMC on average has 20-30 stroke patients per month, with 146 patients evaluated during July-December of 2008, and 138 patients during the same months of 2009.

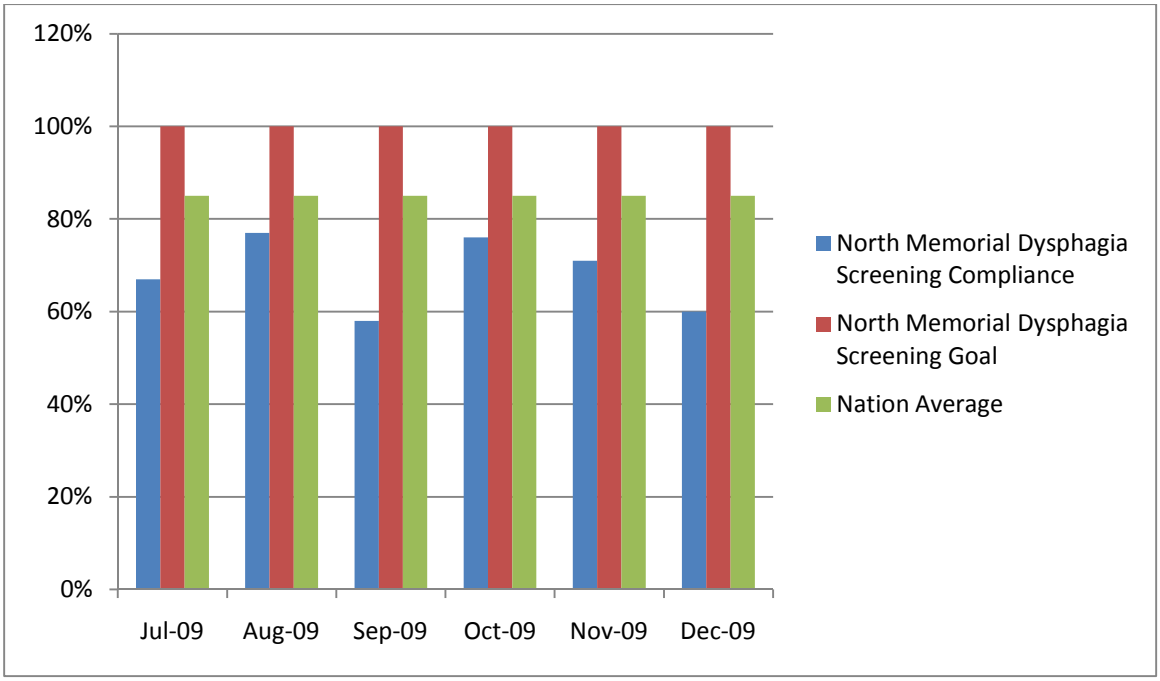
The following graphs, 4.1, 4.2 look at compliance data in 2008 and 2009 respectively and compare actual compliance with North Memorial's goal and national average compliance data. Graph 4.3 is a side by side comparison of 2008 and 2009 data. The six month average of dysphagia compliance in July-December of 2008 was 70%, with the average in July-December of 2009 being 68%, showing a slight

downward trend in dysphagia compliance post education. A two-sample t-test showed no statistical significance between the pre-intervention and post-intervention data with a value of 0.66 using P value of 0.05. A limiting factor was a small sample size. Both 2008 and 2009 data measured below the national average of 85%.

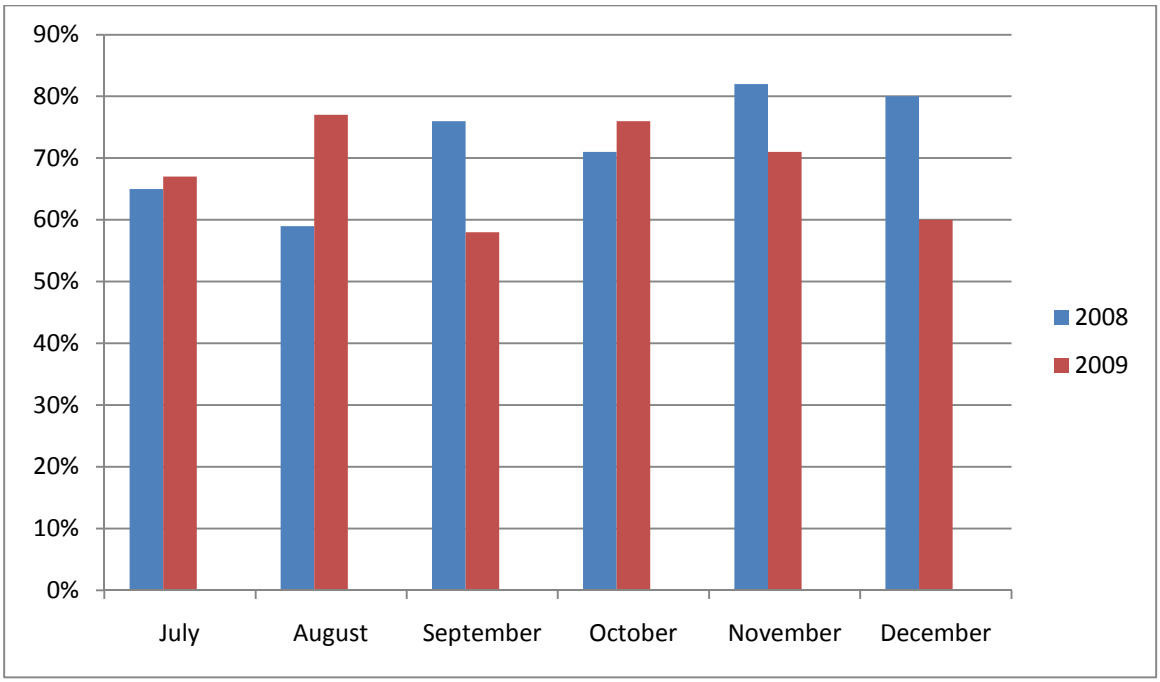
Graph 4.1. Dysphagia Screening Compliance 2008



Graph 4.2. Dysphagia Screening Compliance 2009



Graph 4.3. Dysphagia Screening Compliance 2008 vs 2009



Data collected after the educational sessions was compared to prior data and it showed no improvement in compliance of dysphagia screening. Three of the six months in 2009 data showed improved compliance over 2008 data. Both sets of data measured were below the national average for dysphagia screening. Patient volumes from both six month periods were comparable.

Retrospective chart review offers benefits in research as it is a fairly inexpensive way to gather data, and the data is readily accessible. Retrospective chart review has limitations as documentation can be incomplete due to information that is unrecorded. In nursing the old adage is, “if it wasn’t charted, it wasn’t done”, when in fact the task may have been done but simply not charted. This can alter the reliability of data. Retrospective chart review makes verification of information difficult due to the lapse of time between occurrence of event and actual chart review (Worster & Haines, 2004).

CHAPTER 5: DISCUSSION OF FINDINGS, OUTCOMES AND LEARNING

There are a variety of change theories to use when attempting to alter the behavior of others. I discovered that even with continued support, praise and encouragement to the ED nurses, these external reinforcements were not enough to sustain change. As a nurse leader, the decision to make change is easy; getting others on board is much more difficult. A limitation of this project was that it focused only on the individual nurse, but did not assess the role that structural or environmental issues contribute to the nurse's ability to apply the behavioral change. Retrospective data collection does not allow for the evaluation of extraneous information that could affect a nurse's performance on any given day. Other factors that can contribute to ineffective change are, limited coping skills, lack of self-efficacy, low motivation, interpersonal conflict, negative emotional or psychological states, limited support and stress. Ongoing stroke research will continue to change the way we care for stroke patients. There continues to be advances in preventative therapy as well as medications and interventions once a stroke occurs. To stay on the cutting edge of stroke treatments, we must be adaptable to change. Leaders need to inspire others to step out of their comfort zones and into a new way of thinking and acting. What is important is that we continue to evaluate and make efforts to affect change that will ultimately improve practice and clinical outcomes. Ongoing research is clearly needed to get a better picture of what it takes to make change effective and long lasting.

CONCLUSIONS

Due to poor compliance with dysphagia screening in the ED, the NMMC stroke team is re-evaluating the protocol on swallow assessment. Current discussions pertain to keeping all stroke patients NPO in the ED with only IV or rectal medications being given. Swallow

assessments would then be performed once the patient is admitted to an inpatient room where more time is available for appropriate swallow screening. This ensures that treatment will not be delayed but will also not be harmful to patients. Oral food, fluids and medication can be started after the patient passes a swallow assessment. If the patient continues to have swallowing difficulty, they would remain nothing by mouth (NPO) and a speech therapist would continue to monitor the patient's ability to swallow safely. It's important to be adaptive and change protocols as needed for patient safety and well being. An educational framework would be provided to bedside nurses on the stroke unit regarding their role in swallow assessment. Data collection would continue on dysphagia screening compliance on the stroke unit to evaluate if compliance improved when the RN had more time with the patient. Stroke teams need to be adaptable to ensure patients receive care from staff that have the appropriate level of knowledge, skill and experience. Clinical skills of the entire team need to be maximized to implement competence-based stroke management. Commitment to change and development of competencies is essential as stroke management advances. This requires that time be allotted for education of all team members by the organization. Understandably with today's economy and busy work places this is a challenging issue, but the investment in training is essential to advance knowledge and develop skills. Through projects such as this one, protocols and procedures that are not working can be adapted to ensure best care practices.

Of interest, on January 1, 2010 the day after this project was completed, Joint Commission on the Accreditation of Healthcare Organizations altered their list of measurable outcomes, and will no longer be collecting data on smoking cessation or dysphagia screening. NMMC has chosen to continue to collect this information and believes

it is still an important part of stroke management, but will no longer be a Joint Commission issue for Stroke Center Certification.

DISSEMINATION OF INFORMATION

Dissemination of study information is a valuable learning tool at the completion of any project. First, study results were shared with NMMC health care professionals who treat and provide care for stroke patients. Discussions about the findings took place with the entire team, and most notably the ED nurses, as to why dysphagia compliance did not improve, and what were the barriers to accomplishing this goal. Time limitations in the stabilization room were determined to be the biggest obstacle by the nurses. New practice guidelines are being considered for dysphagia screening to be done outside of the ED. Data will continue to be evaluated to see if this is the correct solution or if further change is needed. This change in protocol produces opportunities to work with another group of nurses on this challenging issue.

Findings from this systems change project will be shared at Nursing Grand Rounds. NMMC offers nurses within the organization a quarterly forum to present nursing issues. In the past, presentations have included case studies, projects and research. It is a wonderful platform for nurses to share information with other nurses within the organization. My goal in presenting in this manner is to persuade nurses to think about their own clinical practice and its influence on patient outcomes, encourage nurses to get involved in projects and not stand on the sidelines when a change is clearly needed, and also to encourage nurses to consider an advanced practice role as the next step in their career.

RECOMMENDATIONS:

The entire process of project planning, implementation, and evaluation was extensive, exhausting, and at the same time also very fulfilling. I gained insight into what it takes to create change within an organization instead of simply being told what the change will be after the fact. The financial return on investment piece was an area of healthcare I had never explored, but with today's soaring healthcare costs, re-imbursement challenges, vast numbers of people without healthcare coverage, and nursing cutbacks it has never been more pertinent to understand these issues. This project did not produce the outcome I was striving to achieve, but gave us valuable information needed to re-evaluate stroke protocols.

Stroke research has come a long way since 1995 when tPA was first used, and new treatment modalities for stroke are undergoing research at NMMC on an ongoing basis. By offering our patients access to experimental and evolving treatments, we are able to increase recovery options. There will continue to be opportunities for doctorally-prepared nurses to function in and advance stroke care. Literature reviews for this project made me aware that further research is needed in several areas regarding dysphagia in stroke patients. While many hospitals use a variety of standardized screening procedures to evaluate for dysphagia in stroke patients, further study is needed to determine which is the most reliable and the safest to detect dysphagia. There is also limited information available to support if percutaneous endoscopic gastrostomy (PEG) feedings are superior to nasogastric feedings, whether supplemental feeding is beneficial, and when feeding should commence after stroke. Today's economy can be a limiting factor for many projects, but change is inevitable in healthcare, and with change comes the ongoing need to work as a team to implement new practice guidelines.

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APPENDIX A

SUMMARY OF LITERATURE REVIEW

Articles	Themes
Adams, Zoppo, Alberts, Bhatt, Brass (2007). Guidelines for the early management of adults with ischemic stroke. Circulation. 115, 478-534.	Evaluates protocols for care of stroke patients within the 1st 48 hours. (EMS, IV tPA, IA tPA, mechanical interventions)
Addington, Stevens, Gilliland (1999). Assessing the laryngeal cough reflex and the risk of developing pneumonia after stroke. Stroke.30, 1203-1207.	N:400. Efficacy of testing laryngeal cough reflex to identify pneumonia risk. Alternate feeding methods are needed if reflex cough test is abnormal.
Beavan, Conroy, Harwood, Gladman, Leonardi-Bee, Sach, Bowling, Sunman, Gaynor. (2009). Does looped nasogastric tube feeding improve nutritional delivery for patients with dysphagia after acute stroke? A radomised controlled trial. Dysphagia. 39 (5) 624-630.	N:104. NG tube feedings used in patients with dysphagiacan be dangerous due to dislodgement. N: 51 nasal loop TF. N:53 conventional adhesive tape. Showed nasal loop safer, with less frequent re-insertion and little additional cost.
Collins, Bakheit. (1999). Does pulse oximetry reliably detect aspiration in dysphagic stroke patients? Stroke. 28, 1773-1775.	N; 54. Study compared pulse oximetry in the diagnosis of aspiration against videpfluoroscopy. Results showed pulse ox reliably predicted aspiration or lack of it in 81.5%. Predictive value low with patients > = 65 and those with chronic lung dz.
Daniels, Ballo, Mahoney, Fundas. (2000). Clinical predictors of dysphagia and aspiration risk: Outcome measures in acute stroke patients. American Academy of Physical Medicine and Rehabilitation. 81 (8), 1030-1033.	N:56. Uses established dysphagia clinical screening system to evaluate outcomes in acute stroke patients. 68% of patients presented with had 2 or more clinical signs of mod-severe dysphagia. 32% had fewer than 2 clinical signs .
Daniels, Brailey, Priestly, Herrington, Weis. (1998). Aspiration in patients with acute stroke. Physical Medicine and Rehabilitation. 79 (1), 14-19.	Silent aspiration appears to be a significant problem in acute stroke of the patients who aspirated. The prediction of patients at risk was significant when abnormal volitional cough and cough with swallow were present.
Davalos, Ricart, Gonzalez-Huix, Soler, Marrugat, Molins, Suner, Genis. (2006). Effect of malnutrition after stroke in clinical outcome. Stroke. 27,1028-1032.	Malnutrition in patients with dysphagia increases risk of decreased immunity and nosocomial infections. N:104. Nutritional parameter. Protein-energy malnutrition after acute stroke is risk facor for poor outcomes.

Doggett, Tappe, Mitchell, Chapell, Coates, Turkelson (2001). Prevention of pneumonia in elderly stroke patients by systematic diagnosis and treatment of dysphagia: an evidence-based comprehensive analysis of the literature. Dysphagia. 16 (4) 279-295.	Evaluates bedside swallow eval, videofluoroscopic and fiberoptic endoscopic exam of swallow in acute stroke patients. Results indicate implementation reduces pneumonia rates.
Garson, Engle, Ormiston (1996). Silent aspiration:Results of 1,000 videofluoroscopic swallow evaluations. Journal of Neuro Rehab. 10 (2), 121-126.	N:1,000. 52% of those tested aspirated with no clinical signs of cough, choking or awareness of aspiration. Bedside swallow evaluations not effective enough.
Kidd, Lawson, Nesbitt, MacMahon (2003). Aspiration in acute stroke: a clinical study with videofluoroscopy. International Journal of Medicine. 86 (12), 825-829.	N:60 42% were assessed to aspirate with videoflouroscopy of these, 20% did not have dysphagia detected with a simple water swallow test. Factors effecting aspiration were decreased pharyngeal sensation, dysphagia and stroke severity.
Leder, Espinosa. Aspiration risk after acute stroke: Comparison of clinical examination and fiberoptic endoscopic evaluation of swallowing. (2002). Dysphagia. 17, 214-218.	Aspiration is related to increased mortality, morbidity, cost of care for acute stroke patients. Evaluated clinical indicators of aspiration risk (dysphonia, dysarthria, abnormal gag reflex, abnormal volitional cough, cough after swallow and voice change after swallow compared with instrumental fibreroptic endoscopic eval.
Lim, Lieu, Phua, Seshadri, Venketasubramanian, Lee, Choo ((2001). Accuracy of bedside clinical methods compared with fiberoptic endoscopic examination of swallow in determining the risk of aspiration in acute stroke patients. Dysphagia. 16, 1-6.	N:50 O2 sats measured before and after swallowing of 10 cc water. O2 desaturation of more than 2% was considered clinically significant. O2 desat test had 76.9% sensitivity and 83.3 % specificity. The 50 cc water swallow test had 84.6% sensitivity and 75% specificity. When both used together sensitivity up to 100% and specificiity 70.8%.
Logemann, Veis, Colangelo (1999). A screening procedure for oropharyngeal dysphagia. Dysphagia. 14 (1), 44-51.	Evaluates the sensitivity and specificity of 28 items of a swallow screening test. Items evaluated include medical history, gross motor variables, oromotor testing, behavioral variables, and observations during trial swallow eval.
Mann, Hankey, Cameron. (1999) Swallow function after stroke : Prognosis and prognostic factors at 6 months. Stroke. 30, 744-748.	N; 128. Swallow dysfunction is common and disabling after stroke. At 6 months 5 ptients had died all with early clinical signs of dysphagia
Martino, Foley, Bhogal, Diamant, Speechley, Teasell (2005). Dysphagia	Database search of 277 sources. Incidence of stroke lowed in hemispheric

after stroke: Incidence, diagnosis, and pulmonary complications. Stroke. 36,2756-2763.	stroke and highest in brainstem strokes. Pneumonia risk highest in patients with dysphagia.
Martino, Pron, Diamant (2000). Screening for oropharyngeal dysphagia in stroke: Insuffucient evidence for guidelies. Dysphagia. 15(1), 19-30.	Eval literature on clinical screening for oropharyngeal dysphagia with stroke. Eval different screening tests.
Martino, Foley, Bhogal, Diamant, Speechley, Teassell (2005). Disphagia after stroke. Stroke. 36, 2756-2763.	High incidence of dysphagia and pneumonia is a consistant finding with stroke. Pneumonia risk is greatest in stroke patients with aspiration.
Massey, Riski, Lathrop, Chase (1998). Aspiration following stroke: Clinical correlates and outcome. Neurology. 38 (9), 1359-1362.	47 stroke patients evaluated clinically and with video swallow, 50% aspirated. Brainstem strokes with bilateral cranial nerve signs had greatest risk, but aspiration occurred also with unilateral signs. Dysphonia was the highest clinical correlate for dysphasia.
McCullough, Rosenbek, Wertz, McCoy, Mann, McCullough (2005). Utility of clinical swallowing examination measures for detecting aspiration post-stroke. Journal of Speech, Launge and Hearing Research. 48, 1280-1293.	N: 165. Evaluate video swallow exam and clinical bedside exams. Clinical practice must be efficient and effective to get best results. Best when swallow assessments are used in combination.
Nilsson, Ekberg, Olsson, Hindfelt. ((2008). Dysphagia in stroke: A prospective study of quantitative aspects of swallowing in dysphagic patients. Dysphagia. 13, 32-38.	Prospective study of 100 patients. Dysphagia 24hrs after stroke increased risk of pneumonia but did not influence the length of hospital stay. Looked at ROSS test for dysphagia evaluation. Only facial weakness were associated with dysphagia.
Odderson, Keaton, McKenna. (1995). Swallow management in patients on an acute stroke pathway: Quality is cost effective. Archives of Physical Medicine and Rehabilitation. 76 (12) 1130-1133.	Assesses effects of swallow management in patients on a clinical pathway. Evaluating if swallow function on admission could predict LOS and outcome disposition. N: 124.
Perry (2001). Screening swallowing function of patients with acute stroke: Identification, implementation and initial evaluation of a screening tool used by nurses. Journal of Clinical Nursing. 10, 463-473.	Disphagia affects 1/3-2/3 patients with acute stroke. Education needed for nurses to use swallow screening tool. Evaluates several tools. Good.
Perry, Love. (2001). Screening for dysphagia and aspiration in acute stroke: a systematic review. Dysphagia. 16, 7-18.	Reviewed 248 articles. 151 met inclusion criteria and 26 met the quality criteria. Clinical characteristics identified. Screening is the essential first step,

	Further exploration needed on patients experiences with dysphagia.
Ramsey, Smithard, Donaldson, Kalra, (2005). Is the gag reflex useful in the management of swallowing problems in acute stroke. Dysphagia. 20, 105-107.	Dysphagia affects 22-65% of acute stroke patients but generally resolves quickly. Bedside swallow is widly used but the significance of an absent gag reflex is controversial.
Ramsey, Smithard, Kalra. (2003). Early assessment of dysphagia and aspiration risk in acute stroke patients. Stroke. 34, 1252-1257.	Dysphagia is a marker of poor prognosis. Refinements are needed to improve the accuracy of bedside swallow testing for early screening.
Schroeder, Daniels, McClain, Corey, Foundas. (2006). Clinical and cognitive predictors of swallowing recovery in stroke. Journal of Rehabilitation Research and Development. 43 (3) 301-310.	Retrospective study, chart review of 65 patients. Hemispacial neglect was significantly associated with initial nonoral dietary intacke, whereas aphasia was not associated with swallowing outcome.
Smith-Hammond, Goldstein. (2006). Cough and aspiration of food and liquids due to oral-pharengeal dysphagia. CHEST. 1129, 154-168.	Cough may be an indicator of aspiration due to oral-pharyngeal dysphagia. Aspiration is observed in over 1/3 of acute stroke patients on X-ray. Treatment of dysphagic patients by a multidisciplinary team is needed. Patients at risk can be identified and appropriate interventions can reduce its associated morbidity.
Smithard, O'Neill, England, Park, Wyatt, Martin, Morris. (1997). The natural history of dysphagia following stroke. Dysphagia. 12: 188-193.	121 consecutive patients admitted with stroke. Swallow evaluated by MD, speech and language pathologist and via videofluoroscopy. 28 swallow problems resolved over the first 5 days. 95 patients post video swallow, with 21 noted to be aspirating. At 1 month 12 were aspirating.
Smithard, O'Neill, Park, England, Renwick, Wyatt, Morris, Martin, (1998). Can bedside assessment reliably exclude aspiration following acute stroke. Stroke. 27 (2): 99-106.	94 patients. Bedside assessment of swallow lacks the necessary sensitivity necessary to be used as a screening tool in acute stroke. The gold standard is videpfluoroscopy.
Smithard. (2006). Long-term outcome after stroke: Does dysphagia Matter?. Stroke. 36 (1): 90-94.	This study confirms that the presence of dysphagia during the acute phase of stroke recovery is associated with poor outcomes during the subsequent year, particularly at 3 months and is associated with increased need for long term care.

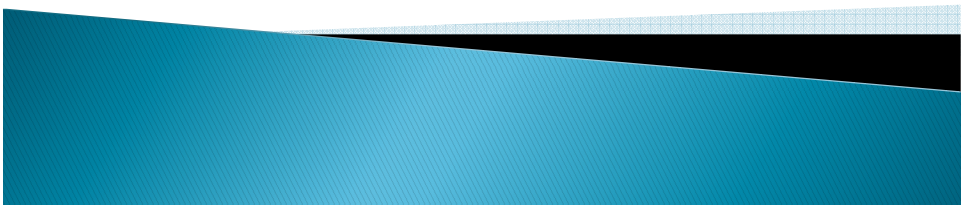
Sulter, Elting, Langedijk, Mauritis, Keyser. (2003). Admitting acute ischemic stroke patients to a stroke care monitoring unit versus a conventional stroke unit: A randomized pilot study. Stroke. 34,101-104.	Mortality was lower in the stroke care monitoring unit than the stroke unit. A larger trial is needed. N:54.
Sundar, Pahuja, Dwivedi, Yeolekar. (2008).Dysphagia in acute stroke: Correlation with stroke subtype, vascular territory and in-hospital respiratory morbidity and mortality. Neurology. 58,103-113.	N:50. 21/50 had post stroke dysphagia. ACA infarcts had 100% incidence od dysphagia. PACA infarcts 36%, PCA infarcts 33%, Lacunar infarcts 16%, hemorrhagic strokes had 67% dysphagia.
Tra.pl, Enderle, Nowotny, Teuschl, Matz, Dachenhausen, Brainin. (2007). Dysphagia bedside screening for acute stroke patients. The Gugging swallow screen. Stroke. 38:1001-1010	Gugging is a stepwise bedside screening test that allows a graded rating with separate evaluations for nonfluid and fluid nutrition starting with nonfluid textures.
Wade, Hewer. (2009). Motor loss and swallowing difficulty after stroke: frequency, recovery and prognosis. Neurologica. 76,50-54.	17% of patients seen within 1 week had no paralysis. At 6 months 48% of survivors had no paralysis. 9% had severe paralysis. Severe paralysis is associated with high fatality in 1 yr. If severe paralysis persists at 3 weeks, full recovery was not observed.
Warnecke, Teismann, Meimann, Olsenberg, Zimmerman, Kramer, Ringelstein, Schabitz, Dziewas. (2007). Assessment of aspiration risk in acute ischemic stroke: evaluation of the simple swallowing provocation test. Journal of Neurology, Neurosurgery and Psychiatry. 79, 312-314.	In acute stroke patients with impairment of the pharyngeal phase of swallowing 1st step reliably detects aspiration risk.In patients with problems in the oral phase of swallowing it fails to detect aspiration.
Westergren. (2006). Detection of eating difficulties after stroke: a systemic review. International Nursing Review. 53, 143-149.	N:2000. Best nursing practice for detecting eating difficulties is the first step to detecting dysphagia. Second step should include pulse oximetry to detect silent aspiration.

APPENDIX B

DYSPHAGIA SCREENING EDUCATION

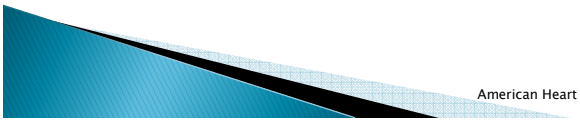
Dysphagia Screening for Acute Stroke Patients

Nancy Downerd MSN, CNP



Stroke Facts

- 700,000 strokes in the U.S. yearly
- 3rd leading cause of death
- Leading cause of disability
- $62.7 Billion annual costs



American Heart Association, 2007

Stroke Facts

- On average, every 40 seconds someone in the U.S. has a stroke.
- 2/3 strokes in people over 65.
- Women have 55,00 more strokes than men annually.
- Men have a higher incidence at younger ages.
- Stroke risk doubles in current smokers.

American Heart Association, 2007

Minnesota Stroke Statistics

- MN consistently one of the healthiest states in the nation
- Stroke is the 3rd leading cause of death
- 2005 2,372 deaths from stroke
- 11,000 hospitalized annually
- $266 million annually

Disparities in Stoke in MN

- American Indian (men 66% higher; women 33% higher)
- African American (men 34% higher; women 61% higher)
- Asian Americans (11% higher)

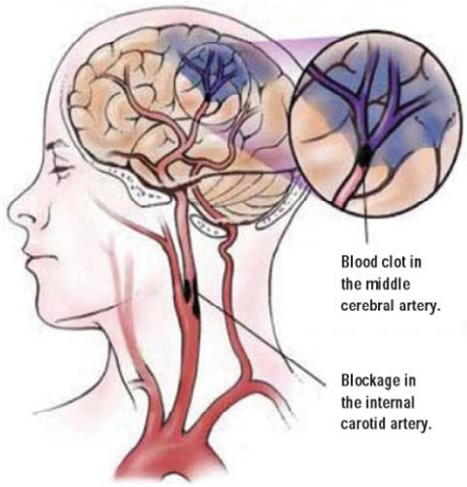
Modifiable Risk Factors

- Alcohol (2-men; 1-women)
- A-Fib (5 fold risk)
- BMI (>25)
- Diabetes (HgbA1C >7.0)
- Dyslipidemia (LDL > 100)
- Hypertension (most important)
- Smoking (doubles risk)

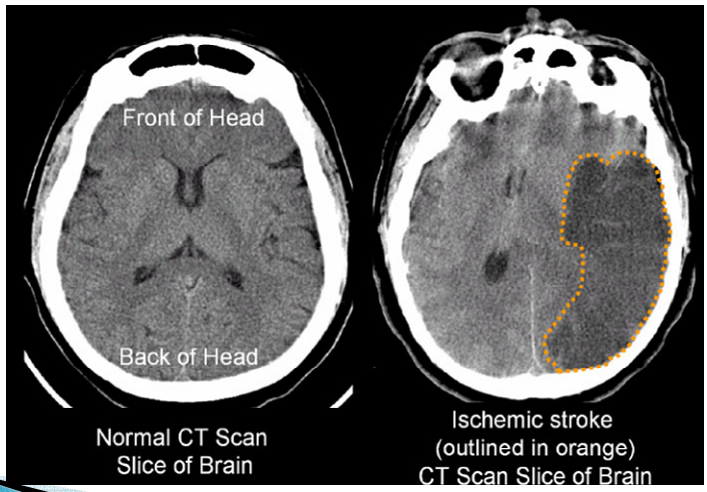
American Heart Association, 2007

Kinds of Stroke

87%
Ischemic

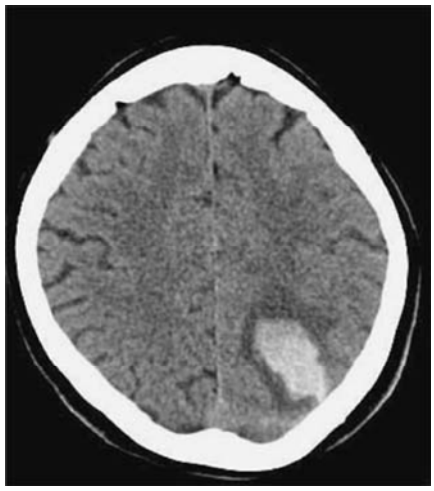


Ischemic Stroke on Head CT



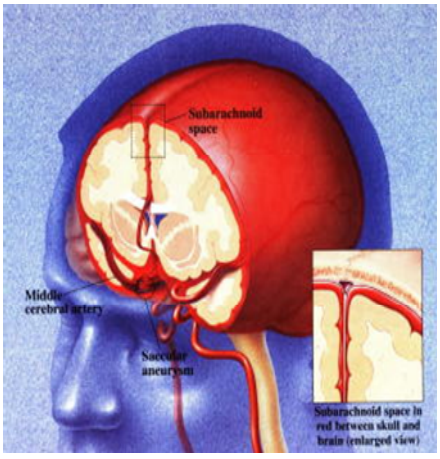
Kinds of Stroke

10%
Intracerebral
Hemorrhage



Kinds of Stroke

3%
Subarachnoid
Hemorrhage



Performance Measures "Scorecard"

- Cholesterol reducing medication
- Antithrombotic medication
- Order set utilization
- DVT prophylaxis
- **Dysphagia Screening**
- Smoking cessation
- Stroke Education

Performance Indicators

- Goals met by 90% compliance
- Goals met by 80-89% compliance
- Goals unmet less than 75% compliance

Joint Commission Stroke Performance Measures Scorecard 2008

North Memorial Health Care

	Driver	Goal	2008 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Best Practice														
Discharged on Cholesterol Reducing Medication - Ischemic only	The JC	100%	85%	64%	86%	50%	68%	58%	86%	80%	100%	93%	92%	80%
IV Thrombolytic Therapy Administered - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
Antithrombotic Therapy By End of Hospital Day Two - Ischemic only	The JC	100%	96%	93%	100%	100%	97%	97%	97%	100%	96%	100%	92%	100%
Discharged on Antithrombotics - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	95%	100%	100%	100%
Patients with Atrial Fibrillation Receiving Anticoagulation Therapy - Ischemic only	The JC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Assessed for Rehabilitation - Ischemic/ICH/SAH	The JC	100%	97%	100%	91%	96%	92%	98%	88%	100%	93%	97%	89%	100%
Deep Vein Thrombosis Prophylaxis - Ischemic/ICH/SAH	The JC	100%	75%	90%	87%	83%	94%	96%	79%	70%	87%	94%	95%	88%
Dysphagia Screening - Ischemic/ICH/SAH	The JC	100%	66%	72%	58%	50%	60%	80%	65%	59%	76%	71%	82%	80%
Smoking Cessation/Advice/Counseling - Ischemic/ICH/SAH	The JC	100%	100%	100%	100%	88%	100%	100%	100%	100%	100%	100%	100%	91%
Stroke Education - Ischemic/ICH/SAH	The JC	100%	97%	89%	85%	63%	69%	64%	72%	54%	47%	63%	38%	50%

North Memorial Health Care

Joint Commission Stroke Performance Measures Scorecard 2009

	Driver	Goal	2009 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Best Practice														
Discharged on Cholesterol Reducing Medication - Ischemic only	The JC	100%	88%	91%	97%									
IV Thrombolytic Therapy Administered - Ischemic only	The JC	100%	100%	100%	100%									
Antithrombotic Therapy By End of Hospital Day Two - Ischemic only	The JC	100%	97%	100%	100%									
Discharged on Antithrombotics - Ischemic only	The JC	100%	100%	95%	100%									
Patients with Atrial Fibrillation Receiving Anticoagulation Therapy - Ischemic only	The JC	100%	100%	100%	100%									
Assessed for Rehabilitation - Ischemic/ICH/SAH	The JC	100%	97%	96%	100%									
Deep Vein Thrombosis Prophylaxis - Ischemic/ICH/SAH	The JC	100%	87%	94%	92%									
Dysphagia Screening - Ischemic/ICH/SAH	The JC	100%	63%	64%	68%									
Smoking Cessation/Advice/Counseling - Ischemic/ICH/SAH	The JC	100%	100%	100%	100%									
Stroke Education - Ischemic/ICH/SAH	The JC	100%	63%	83%	69%									

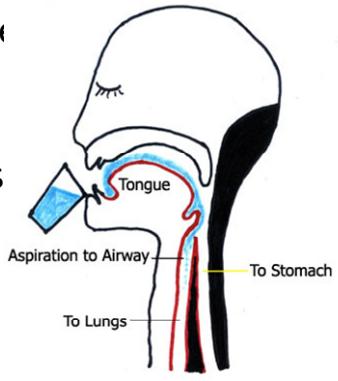
90% of Goal | 80 - 89% of Goal | Less than 79% of Goal

Dysphagia Screening

Performance outcomes have indicated that dysphagia screening compliance at North Memorial is 50-82%

Dysphagia

- Swallowing difficulties in the oral and/or pharyngeal stage
- Silent aspiration: no outward signs of distress



Dysphagia in Acute Stroke

- Common complication and strongly associated with poor outcomes, increasing mortality 3-fold.
- Dysphagia for the first 1-3 days is 42-67%
- Aspiration in 1-5 days is 43-54% (37% leading to pneumonia).
- Given the aforementioned 700,000 annual strokes, a formal dysphagia protocol could save more than 8,000 lives and prevent 40,000 cases of pneumonia each year.

Hinchey et al, 20005

Dysphagia is Associated With:

- Malnutrition
- Dehydration
- Aspiration
- Pneumonia
- Increased hospital stays by 7-10 days.
- Increased mortality.
- Poor long term outcomes.

Warnecke, 2008

Clinical Predictors for Aspiration

- Dysphonia
- Dysarthria
- Abnormal gag reflex
- Abnormal volitional cough
- Cough after swallow
- Voice change after swallow

Daniels, 2000

Initial Signs of Dysphagia

- Refusal to eat
- Drooling and Coughing
- Choking on oral secretions
- Breathlessness
- Lack of tongue movements
- Poor facial tone
- Inability to follow commands

Davis, 2005

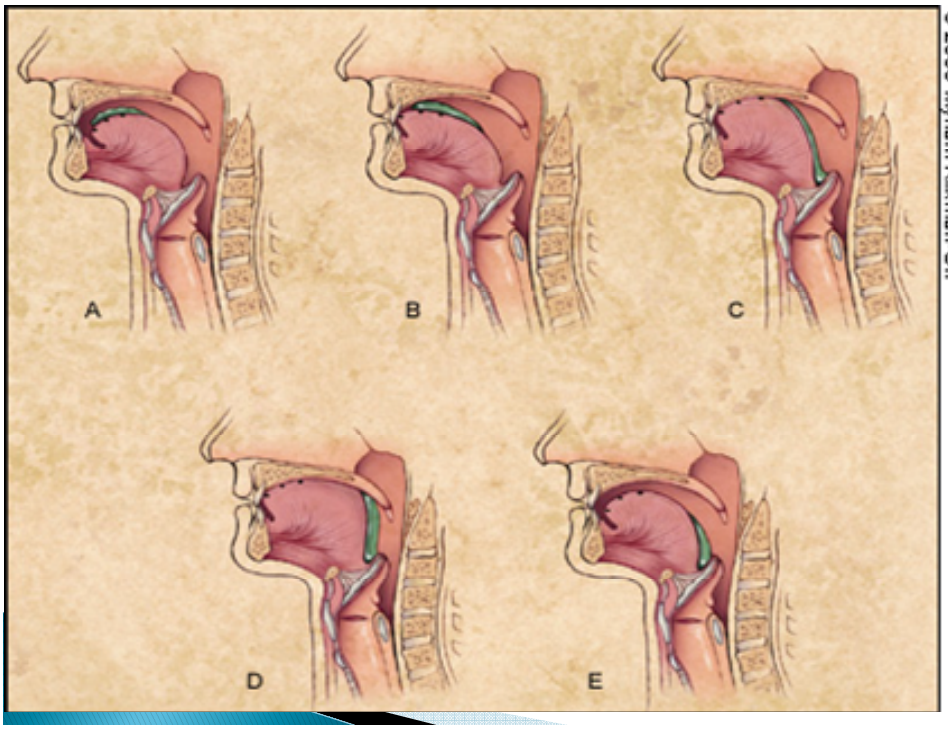
Given the incidence of stroke, the prevalence of dysphagia, the risk of aspiration, and the effects of pneumonia in terms of mortality, morbidity, and cost of care, the identification of dysphagia is clinically and financially significant.

First Phase of Normal Swallow

The sight, smell, and taste of food and drink triggers the production of saliva, so when food is put in the mouth there is extra fluid to make chewing easier.

Second Stage of Swallow

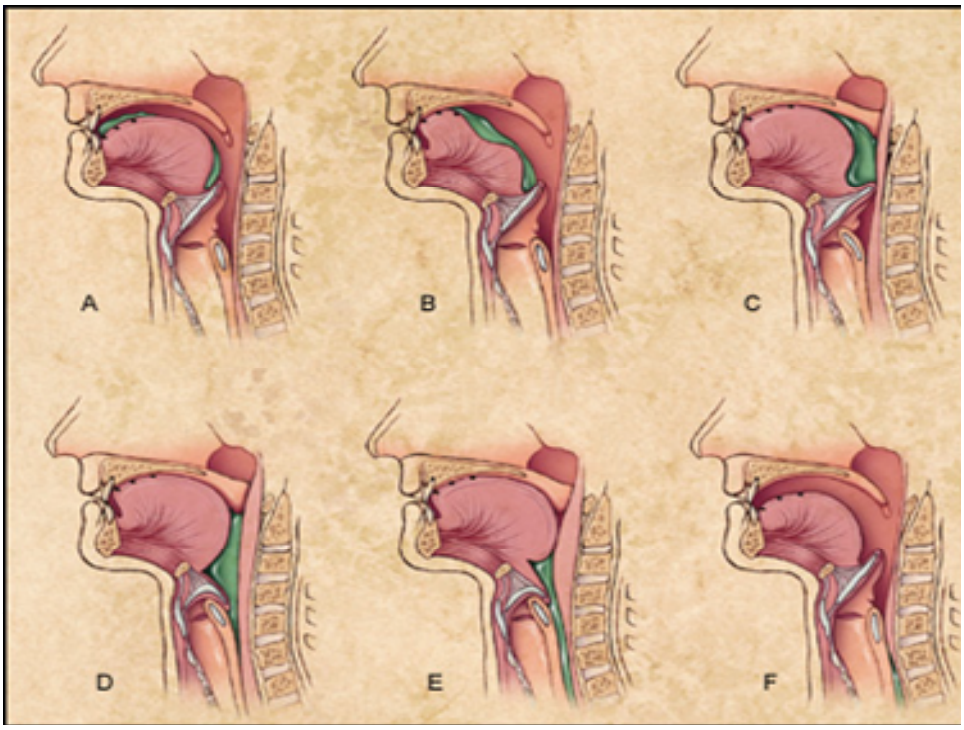
Chewed food makes a soft bolus, the tongue moves food to the back of the mouth to the top of the esophagus (pharynx). Voluntary Stage.



Third Stage of Swallow

Once the bolus reaches the pharynx, the swallow becomes automatic.

The voice box (larynx) closes to prevent food or liquid from getting into the upper airway and lungs, making the food bolus pass down the esophagus.



Fourth Stage of Swallow

The esophagus which is a tube with muscular walls, contracts automatically propelling food down to the stomach.

If swallow is difficult, the problem can be at any 1 or more of these four stages.

Please follow
North Memorial's
Swallow Assessment Protocol
per Alogrithm

Swallow Test

If a patient fails the swallow evaluation….
KEEP
THEM
NPO
and refer to
Speech Therapy for a comprehensive swallow assessment

Expected Outcomes of Swallow Screening

1. Respiratory: Prevent “aspiration pneumonia”
2. Nutritional: Prevent malnutrition, dehydration
3. Financial: Limit healthcare expendititure for preventable consequences of dysphagia
4. Physiologic: Restore normal swallow physiology
5. Quality of Life: Restore mealtime enjoyment

Nurses have the opportunity to change the course of a patients outcome by consistently performing a bedside swallow assessment.


GO GREEN
For Dysphagia Screening Compliance

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